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EXAMINER

ADHAMI, MOHAMMAD SAJJID

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2416

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

- Applicant's amendment filed 6/18/2009 is acknowledged.
- Claims 9 and 85 have been amended.
- Claims 10-14,16-18,24-29,31-53,61,63,65-70,73-78, and 88-92 are withdrawn from consideration.
- Claims 1-92 are pending.
- Applicant's response and amendment with respect to the rejection of claims 9 and 85 under 35 USC 112 2nd paragraph is noted and the rejection is withdrawn.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1,2,9,15,54,55,71,79, and 80 are rejected under 35 U.S.C. 102(a) as being anticipated by Witschnig ("A Different Look on Cyclic Prefix for SC/FDE" Personal, Indoor and Mobile Radio Communications, 20002. The 13th IEEE International Symposium ON, col.2 15-18 Spet.2002, pages 824-828 referred to as Witschnig).

Re claims 1,15,54,71,79 and 80:

Witschnig discloses *transmitting a signal comprising OFDM units* (Fig.1 ref. Transmitter and Fig.2 and Fig.3 is an OFDM unit and Section IIIB the

structure of a transmitted block, which consists of the original data sequence of N symbols and the sequence of the UW with N symbols).

Witschnig further discloses *each OFDM transmission comprising an OFDM symbol and before/and/or/after the OFDM symbol a respective non-OFDM segment* (Fig.2 and Fig.3 is an OFDM unit and Section IIIB the structure of a transmitted block, which consists of the original data sequence of N symbols and the sequence of the UW with N symbols – where the N symbols are OFDM symbols and the UW is a non-OFDM segment).

Witschnig further discloses *the non-OFDM segment containing known data and/or unknown highly reliable data* (Section IIIA if its content would be known before and could be chosen in a proper way and Section IIIB Unique word. Instead of the cyclic prefix, a known sequence is part of every processed block).

Witschnig further discloses *the non-OFDM segment allowing a conversion at a receiver between a linear convolution and a cyclic convolution for the OFDM symbol* (Section IIIB With this extended block the linear convolution of the i-th block with the channel impulse response becomes a circular convolution).

Re claims 2 and 55:

Witschnig discloses *the non-OFDM segment being at least long enough to cover any significant ISI introduced by a previous OFDM symbol* (Section II If the guard interval is longer than the duration of the channel impulse response, there is no interference between the information symbols of successive blocks).

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Re claim 9:

Witschnig discloses *a guard time on either side of each non-OFDM segment (Fig.3 and Fig.2).*

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-6 and 56-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Krishnan (US 6,928,062).

Re claims 3-6 and 56-60:

As discussed above, Witschnig meets all the limitations of the parent claim.

Witschnig does not explicitly disclose *a code separated pilot channel, signaling channel, and traffic channel, multiple channels that are time division multiplexed, and IFFT.*

Krishnan discloses *a code separated pilot channel, signaling channel, and traffic channel, multiple channels that are time division multiplexed, and IFFT* (Fig.6 ref. 622 is a pilot channel ref.624 is a signaling channel and ref.630 is a traffic channel and Col.3 lines 59-65 These techniques may also be used for hybrid systems such as an OFDM TDM system that transmit pilot/signaling and

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traffic data using time division multiplexing, whereby OFDM is used for pilot/signaling and another transmission scheme is used for traffic data and Col.5 lines 10-11 an inverse fast Fourier transform (IFFT) to obtain a transformed symbol).

Witschnig and Krishnan are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include a signaling, traffic, and pilot channel as taught by Krishnan in order to use a well-know transmission scheme.

5. Claims 7,8, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Walton (US App. 2004/0081131).

Re claims 7 and 8:

As discussed above Witschnig meets all the limitation of the parent claim.

Witschnig does not explicitly disclose *generating OFDM symbols using fixed duration with varying IFFT size and generating the non-OFDM segments to have fixed duration with varying numbers of sample.*

Walton discloses *generating OFDM symbols using fixed duration with varying IFFT size and generating the non-OFDM segments to have fixed duration with varying numbers of sample* (Para.[0040] the OFDM symbol size for some time segments may be fixed for other time segments may be configurable and Para.[0101] variable-size IFFT).

Witschnig and Walton are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include OFDM symbols using fixed duration and varying IFFT size as taught by Walton in order to allow the transmitter and receiver to be correlated and to adapt the data transmission to increase efficiency.

Re claim 23:

As discussed above Witschnig meets all the limitation of the parent claim.

Witschnig does not explicitly disclose *transmitting data content of multiple users on the OFDM symbol*.

Walton discloses *transmitting data content of multiple users on the OFDM symbol* (Para.[0010] For OFDMA, multiple users share the large OFDM symbol).

Witschnig and Walton are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include transmitting data content of multiple users on OFDM symbols as taught by Walton in order to use a well-known transmission scheme.

6. Claims 19,64,80,81, and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Hiramatsu (US 7,298,692).

Re claims 19,64,80,81, and 85:

As discussed above, Witschnig meets all the limitations of the parent claim.

Witschnig does not explicitly disclose *transmitting a first, second, and third segment and a first and second non-OFDM segment where at least one of the data segments is OFDM and CDMA*.

Hiramatsu discloses *transmitting a first, second, and third segment and a first and second non-OFDM segment where at least one of the data segments is OFDM and CDMA* (Col.5 lines 16-19 a preamble portion is a CDMA signal, a data portion is an OFDM signal, and both signals are multiplexed to be transmitted and Fig.1 and Col.2 lines 44-51 using OFDM signals or OFDM/CDMA signals over the downlink and CDMA signals over the uplink).

Witschnig and Hiramatsu are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include transmitting a first, second, and third segment and a first and second non-OFDM segment where at least one of the data segments is OFDM and CDMA as taught by Hiramatsu in order to ensure transmission quality while improving spectral efficiency.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Hiramatsu as applied to claim 19 above, and further in view of Walton (US App. 2004/0085892 referred to as Walton2 below).

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Re claim 20:

As discussed above, Witschnig meets all the limitations of the parent claims.

Witschnig does not explicitly disclose *being compatible with IS-856*.

Walton2 discloses *being compatible with IS-856* (Para.[0005] the system may also be designed to implement IS-856).

Witschnig and Walton2 are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include being compatible with IS-856 as taught by Walton2 in order to make a more robust system.

8. Claims 21,22,82-84,86, and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Hiramatsu as applied to claims 19,81, and 85 above, and further in view of Montojo (US 6,693,920).

Re claims 21,22,82-84,86, and 87:

As discussed above, Witschnig meets all the limitations of the parent claims.

Witschnig does not explicitly disclose *segments of 224,400, and 2048 chips, 64 MAC segment and a 96 chip pilot segment*.

Montojo discloses *segments of 224,400, and 2048 chips, 64 MAC segment and a 96 chip pilot segment* (Fig. 2 – where the 2 MAC chips and pilot chip make up a 224 chip segment).

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Witschnig and Montojo are analogous because they both pertain to data communication.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include segments of 224,400, and 2048 chips, and 64 MAC segment and a 96 chip segment as taught by Montojo in order to use a well-known transmission format.

9. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Yakhnich (US 6,907,092).

Re claim 30:

As discussed above, Witschnig meets all the limitations of the parent claim.

Witschnig does not explicitly disclose *3 tail bits, a 58 point idft, a 26 bit training sequence, a second 58 point symbol, 3 tail bits, a 8.25 bit duration guard period.*

Yakhnich discloses *3 tail bits, a 58 point symbol, a 26 bit training sequence, a second 58 point symbol, 3 tail bits, a 8.25 bit duration guard period (Fig.2).*

Witschnig and Yakhnich are analogous because they both pertain to network communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include 3 tail bits, 58 points symbols and a

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8.25 guard period as taught by Yakhnich in order to minimize the time varying effects (Yakhnich Col.2 lines 52-54).

10. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Witschnig in view of Montojo.

Re claim 62:

As discussed above Witschnig meets all the limitations of the parent claim.

Witschnig does not explicitly disclose *a 64 chip MAC segment, a 96 chip pilot segment, and a 64 chip MAC segment*.

Montojo discloses *a 64 chip MAC segment, a 96 chip pilot segment, and a 64 chip MAC segment* (Fig. 2 ref.208A, 206A, and 208A).

Witschnig and Montojo are analogous because they both pertain to data communications.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Witschnig to include a 64 bit MAC segment and a 96 bit pilot segment as taught by Montojo in order to use a well-known transmission format.

Response to Arguments

11. Applicant's arguments filed 6/18/2009 have been fully considered but they are not persuasive.

In the remarks, Applicant contends Witschnig does not disclose transmitting an OFDM signal.

The Examiner respectfully disagrees. Witschnig does disclose transmitting an OFDM signal (Fig.1 ref. Transmitter and Fig.2 and Fig.3 is an OFDM unit and Section IIIB the structure of a transmitted block, which consists of the original data sequence of N symbols and the sequence of the UW with N symbols). Although Witschnig may focus on SC/FDE, it still discloses transmitting an OFDM signal. The discussion of SC/FDE is in relation to techniques used with OFDM (Section V the adoption of techniques initially associated with OFDM). The mention of these techniques also fulfils the teachings of OFDM. The disclosure of Witschnig relates to aspect of OFDM that are used, which includes transmitting a Cyclic Prefix used for OFDM signals (Section I. "In section III the concept of cyclic prefix (CP), that is used for OFDM and SC/FDE...is described in detail"). Section III shows a transmitted data structure. Furthermore, Section IV mentions "Methods that are not based on special sequences were developed for OFDM and can be implemented for SC/FDE too."

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD S. ADHAMI whose telephone number is (571)272-8615. The examiner can normally be reached on Monday-Friday 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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